

BALLOON MEASUREMENTS OF AEROSOL IN THE ANTARCTIC STRATOSPHERE (Abstract)

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Balloon measurements of aerosol in the lower stratosphere were made in 1983 to investigate the behavior of the polar stratospheric aerosols. Three aerosol soundings were conducted from Syowa Station, Antarctica. Number concentration and the size distribution of Mie particle (aerosol particles with diameter greater than $0.3\ \mu\text{m}$) were measured by using a light-scattering aerosol particle counter. The counter is made to be suitable for the balloon measurements in the Antarctic stratosphere. The counter has two pulse height discriminators to differentiate the size of the particles having the diameter ≥ 0.3 and $\geq 0.5\ \mu\text{m}$, respectively, for the refractive index of 1.40. Thus a rough indication of the size distribution is obtained.

Though three aerosol soundings were carried out, the present discussion concerns the last two flights (June 3 and October 16), because the result on April 1 is limited in the troposphere. High aerosol concentration was obtained during the flight on October 16 in the stratosphere. Compared with the number concentration obtained from the measurements during a period of low volcanic activity, the concentration was about 3 times higher than that of the low volcanic period. The high concentration could be attributed to the effect of the eruption of El Chichón in April 1982. Very high concentration was obtained from the first successful aerosol balloon sounding in the winter Antarctic stratosphere on June 3. The aerosol concentration was about 10–15 times higher than that of the low volcanic period. Though the effect of El Chichón may be partly responsible for the enhanced aerosols, this result gives a direct evidence of “winter increase of the aerosol concentration in the Antarctic stratosphere”. The profile of aerosol count ratio suggests that the particle size in the enhanced aerosol concentration region seems to be similar to that normally appearing in the mid-latitude stratosphere.

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BALLOON MEASUREMENT OF THE STRATOSPHERIC NO₂ BY THE 23RD JAPANESE ANTARCTIC RESEARCH EXPEDITION (Abstract)

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The stratospheric NO₂ over Antarctica was measured with a spectrophotometer on board the balloon B5.JA21 launched from Syowa Station (69°S, 40°E) on November 24, 1982. The principle of the measurement is solar absorption spec-